in the present, and yet in some unexplained way "projected efficiency" decides the issue. When we look facts in the face we find that our anti-materialistic philosophy is not saving us from entering upon the same ruinous course on which the French nation has already proceeded far. Our diminishing birthrate shows that there has already begun among our people that artificial limitation of fertility which must, if it continues, bring national decline with it.

We all wish that these evils should come to an end and that the English-speaking peoples should have a magnificent future before them. Towards this, no doubt, an anti-materialistic philosophy is a help. Materialism is incompatible with real greatness in an individual or a nation. So far we may go with Mr. Kidd. But we cannot allow that he has found a formula in which all our great problems—the problems of evolution, civilisation, religion—find their solution. The problems remain as they were. F. W. H.

GALLS.

British Vegetable Galls, an Introduction to their Study By E. T. Connold. Pp. xi+312. (London: Hutchinson and Co., 1901.) Price 10*s.* 6*d.* net.

THIS beautiful book is a great disappointment. The title, the nice paper, with its broad margin and excellent print, and, above all, the majority of the one hundred and thirty full-page plates paraded, and by no means unjustly so, on the title-page, all promise so much, and yet—on looking beneath the surface we find no depth. Typical examples of the disappointments in store for the reader are furnished by Plates 14 and 15; it would be difficult to over-praise the beauty of the process-work of the former plate, and yet practically all the information the author gives is confined to a few meagre lines on pp. 58 and 60, chiefly concerned with a note as to where the specimen was found. True, more careful search shows that Plate 47 is concerned with the same subject, and somewhat more scientific hints are appended to this on p. 126; but why, in the name of all knowledge, are we not told something of the structure and development of these galls and their contents? Unless we are mistaken, or misled by synonymy, the very example here referred to is a classical one. Did not Dujardin describe the mite in the hazel-buds in 1851? and did not Miss Ormerod and Schlechtendal show that witches' brooms on the alder arise from the irritation set up by similar species? In this connection, also, excellent illustrations of the witches' brooms themselves are given on Plates 1, 16, 17 and 18, with such irritating gossip as "this very interesting tree stands just within the confines of the Park"—"Park," with a capital P!

Now, if we may be permitted to direct the attention of the author (who is the honorary general secretary to the Hastings and St. Leonard's Natural History Society) to the grand opportunity he has missed, pointing out at the same time that scientific experts rarely obtain the chance of putting forth their text illustrated in the superb style of this book, some service may be done in advocation of the cause of that most useful branch of biology—good descriptive field-work in the domain of the borderland between zoology and botany.

It is scarcely too much to say of the present book that if the text to these excellent plates had been nothing more than even a fair account of the insect and its gall, such as is given in a handbook like that of Frank, it would have been one of the most worthy and useful books on the subject—how much more so had the text risen to the level of Adler's admirable study of oak-galls! If local natural history societies would only resist the temptation to be popular, in the sense which implies being merely attractive to superficial and "smart" people, what an immense amount of valuable work might be done along the lines suggested by the present volume, which, disappointing though it is, is sufficiently good to show that the author must be capable of far better work.

We sincerely hope that in a second edition the author will give such notes concerning the structure and development of the galls, the habits of the insects producing them, and their effects on the plants infested by them, as could be obtained from such authors as we have quoted, and from the works of, for instance, Küster, Molliard and other modern investigators; such an account, added to the more extensive notes on field-work which Mr. Connold could evidently bring together—as may be judged from the present samples—should be worthy of the subject, and would be far more welcome to his fellow-lovers of nature than these pages of desert margin with their oases of meagre information, however excellent the latter may here and there be in itself. We are the more constrained to urge this because we understand that the author contemplates a separate book on oak-galls. If the illustrations are as good as these, and the text far better, we shall anxiously look for that book.

THE EVOLUTION OF LIFE.

L'Évolution de la Vie. Par le Dr. Laloy, Sous-Bibliothécaire de la Faculté de Médecine de Bordeaux. Pp. xii + 240. (Paris: Libraire C. Reinwald; Schleicher Frères, 1902.) Price fr. 2·50.

THIS volume is the third of a series being issued in France under the designation of the "Petite Encyclopédie du XX^{e} Siècle." The object of the work, as set forth in the preface, is the very praiseworthy one of spreading a sound knowledge of the achievements of modern science among the intelligent public in a popular way. As the author points out, the mental equipment of the man of culture of the present time consists of art, literature and *belles-lettres*. Of modern science he knows nothing and cares to know nothing. Even among scientific workers themselves the extreme specialisation necessitated by original work often prevents a general perspective of the whole subject being gained. The trees prevent the individual hewer of wood from seeing the forest as a whole. We have long recognised the need for imparting scientific "culture" to the reading and thinking public in this country, and many excellent series of popular works by our foremost men of science might be mentioned. How far the present work is likely to give French readers a sound idea of modern

evolution is very difficult for an English reviewer to judge. The author deals with the subject in a way that has been made familiar by the writings of Haeckel, and we cannot say that he sheds any new light on the various questions or that his treatment is particularly lucid. Here and there Dr. Laloy lets fall a suggestive analogy or makes a remark which shows that on many of the fundamental questions of modern biology his views are at any rate sound. If he admits of being pigeon-holed at all, we should say that as regards the origin of life he is a neo-vitalist. His suggestion that protoplasm may have arisen in the first place by the direct combination of carbon with water and the subsequent combination of the carbohydrate with nitrogen under the influence of the electric discharge (p. 28) is based upon a statement of Berthelot's—that cellulose and dextrin can "fix" nitrogen under the influence of the silent electric discharge. This view is not likely to find favour, we imagine, until we have some more substantial basis of fact to support it.

Concerning the descriptive part of the book, in which the various groups of animals and plants are dealt with from the point of view of evolution in ascending order, there is little to be said. The chief interest for the student of evolution is really concentrated in the seventh chapter, in which the author reveals his position. After putting forward the well-known arguments from rudimentary organs and embryology in favour of some doctrine of evolution being necessary, Dr. Laloy proceeds to consider the factors of evolution. He considers "la lutte pour la vie et la sélection" of Darwin to be inadequate and he accordingly assigns to natural selection a quite subordinate part in the formation of species. It is difficult, however, to find out precisely what is, according to the author, the prime factor of species formation. So far as can be gathered from the text, he appears to favour a kind of sudden and spontaneous variation of all the individuals simultaneously in the direction required to adapt them to new conditions (p. 104). He relies for this remarkable factor upon the experiments of Bonnier and the observations of De Vries, and he adds :—

"Ce serait selon moi cette variation brusque et totale, cet état de mutation, comme s'exprime De Vries, qui serait la véritable cause de la formation des espèces. La lutte pour la vie et la sélection ne seraient plus que des facteurs secondaires, qui n'entrent en jeu que pour fixer et rendre stables les variations acquises en bloc et surtout, pour supprimer les différenciations fâcheuses. Elles maintiennent les espèces dans leur caractère normal, mais ne sauraient en former de nouvelles. Ainsi, comme cause principale de l'évolution, nous retrouvons encore cette finalité du protoplasma qui lui permet de s'accommoder aux circonstances les plus diverses."

This is the key to the author's position as an evolutionist. It is not likely that many adherents to these views will be found in this country. Pure Lamarckism—however inadequate we may regard it—seems, on the whole, to have something more tangible about it than the variation "brusque et totale" of all the individuals of a species in order to meet any emergency in the conditions of life. It is remarkable that a countryman of Lamarck's should go out of his way in order to introduce a factor which receives such very slender support from the observed facts of nature. R. M.

OUTLINES OF PHYSIOLOGY.

A Primer of Physiology. By Alec Hill, author of "An Introduction to Science," &c. Pp. x + 105. (London : J. M. Dent and Co.)

IN this tiny primer of 105 pages the author attempts to give a general sketch of the subject of physiology, treating especially of those parts which may be supposed to be of most interest to a reader who is not contemplating the profession of medicine, and has not the appliances of a laboratory at his command.

As the author truly remarks in his preface :—

"The subject is so vast that a series of primers would be needed to approach its several departments through the elements of physics, chemistry, anatomy, and the other sciences upon which they are based."

Mr. Hill does not state whether these needed primers are subsequently to appear from his pen, but should they do so there is little doubt that they will prove quite as interesting to the student of physiology as the one now under consideration.

Although the space at his disposal is so exceedingly limited, yet the author finds room to dip occasionally into the realms of medicine. Here is an example of such an application taken from p. 14 :—

"The expression to 'purify the blood' is a vestige of a long-abandoned theory of medicine. In the sense in which it is used, to imply that carbuncles, boils and pimples are due to 'bad blood,' it is absurd and misleading. It is none the less true, however, that health, as shown by muscular vigour and perfect freedom from neck-ache, pains in the limbs, and other 'gouty' symptoms depends upon the blood being fully charged with oxygen, and sufficiently free from nitrogenous waste products to keep the juices of the body in a pure state."

Then in a few cogent words the author deals with the *rationale* of massage, the effect of hot baths, and the therapy of diuretics such as "sweet spirits of nitre" or "salts of various kinds"; and all this is done in one short half page.

Terseness is naturally the characteristic of this little primer throughout, but we scarcely agree with the tacitly assumed idea of the author that by the judicious use of leaded type the necessity for wasting precious space in giving definitions can be avoided. For example, the hitherto uninstructed person in physiological matters will scarcely understand at a first glance what is meant by lymph, epithelium and protoplasm, unless some explanation, other than that mentioned above, be given him.

The book opens with a four-page account of the structure, given necessarily in hasty outline, of the mammalian body; there follow eight or nine pages on minute anatomy, in which half a page is found for a description of "caryokinesis," and then, in less than forty pages, the blood and vascular system, the neuro-muscular system, digestion, absorption, dietetics and respiration are rapidly reviewed. Rather more than half the space is thus left over for the central nervous system and special senses, and here in his own special domain the author is peculiarly at home, and his imageries and analogies are at